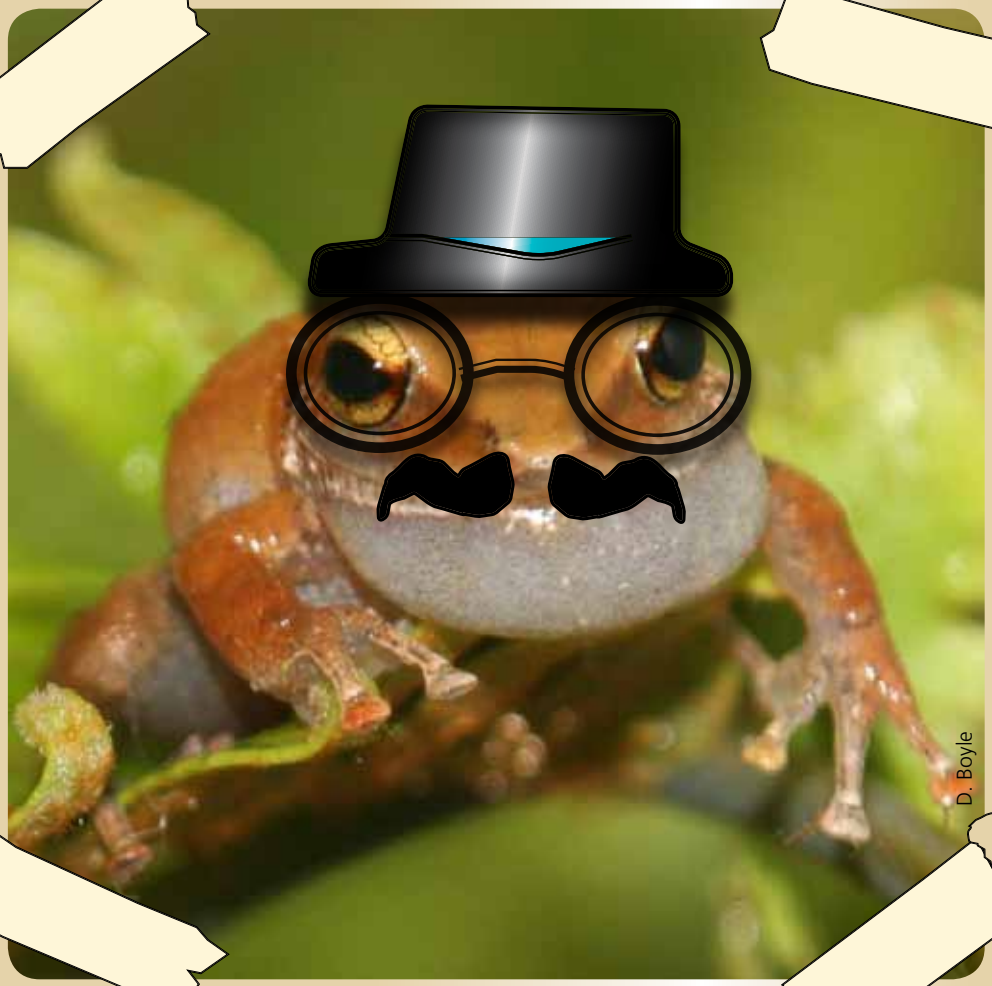
Inventory & Monitoring
Pacific Island Network

National Park Service
U.S. Department of the Interior

Pacific Island Network Quarterly

Quarterly Newsletter of the Pacific Island Network (PACN) Inventory & Monitoring Program
July – Sept. 2010, Issue no. 21

HAVE YOU SEEN THIS FROG ?



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The National Park Service (NPS) has implemented natural resource inventory and monitoring on a servicewide basis to ensure all park units possess the resource information needed for effective, science-based management, decision-making, and resource protection.

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Vegetation Team News

Reid Loo (middle-left) joined the NPS I&M vegetation team in May as a seasonal technician. Born and raised on the island of Hawai'i, Reid spent his adolescent years on O'ahu, attending the Kamehameha Schools. Upon completion of high school, he returned home to pursue an undergraduate degree in Agriculture and Natural Resource Management at the University of Hawaii at Hilo. Since then, Reid has worked with the U.S. Forest Service, Carnegie Airborne Observatory, and the University of Hawaii. He enjoys the great outdoors; whether it be growing plants or catching fish.

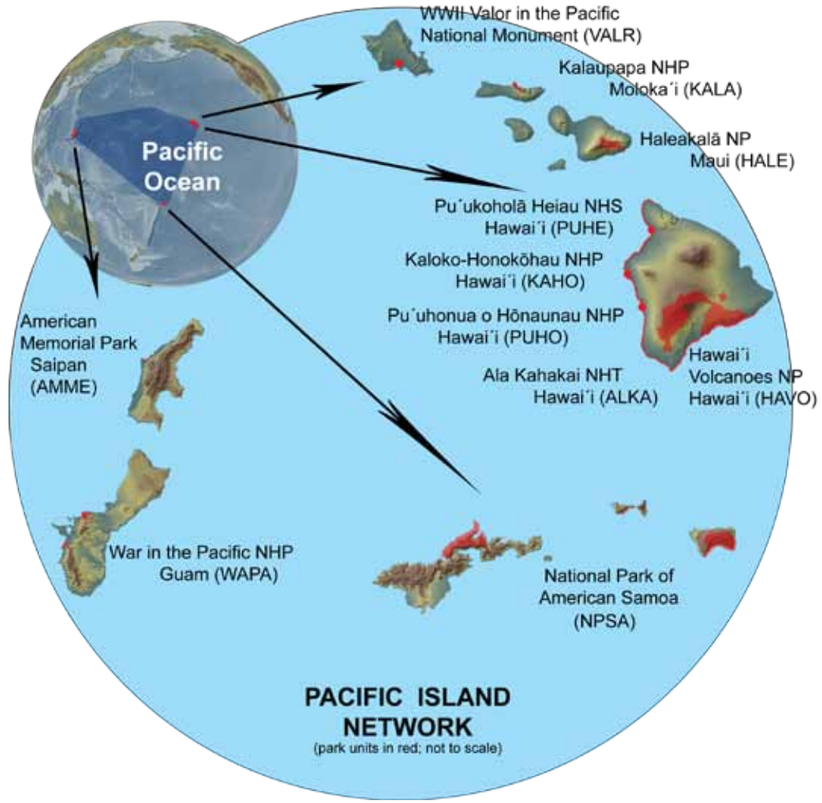
Daemerson "Koa" Awong (right) is from Volcano Village adjacent to Hawai'i Volcanoes National Park. He received a Bachelor of Science degree in Natural Resource Management from the University of Hawaii at Mānoa. He likes Volcano Village because it is quiet and peaceful. Koa is looking forward to learning as much as he can in his position as a seasonal Biotechnician on the vegetation team, especially with identifying plants. Koa likes to fish, swim, surf, anything at the beach, and to spend time with family and friends. He also enjoys camping and the outdoors.

Adios and aloha to Biological technician **Julie Christian** who has worked with the vegetation team for the past year. She is seeking new adventures in the American Southwest.

Adam Mehlhorn (left) spent the last three years traipsing around the Brooks Range in northern Alaska as a backcountry ranger at Gates of the Arctic National Park. Summers were short and sweet in Alaska, so in a lifelong quest to avoid the winter he decided to return to the tropics of Hawaii. He developed a taste for the Aloha State while attending graduate school at UH-Mānoa. He completed his Master of Science degree in Natural Resource Management in 2006 before returning to Alaska for work. Working for the NPS can literally take someone from one extreme to another. One week he found himself 100 miles north of the Arctic Circle and the next week he was spending his field days in the tropics of Hawaii as Crew leader of a great monitoring team.

Laura Arnold (middle-right) is grateful for the privilege of working in these lands and for waking up to the calls of native birds when camping in wild places. She started learning Hawaiian forest plants through many days of volunteering and working to control invasive species in upland forests on Kaua'i island. Interested in learning more about the details of native plants and birds, and the ecosystems they need, she moved into doing field work for research projects.

Laura earned a Bachelor of Science degree and explored her first career in software engineering and systems analysis before transitioning to field work. Now she spends more time outside getting muddy and being happy.



EXTRA !

Papahānaumokuākea Marine National Monument is declared a UNESCO world heritage cultural and ecological site. This historic designation marks the first combined cultural and natural world heritage site in the United States. Aulani Wilhelm, NOAA Superintendent for the Monument stated, "We hope Papahānaumokuākea's inscription will help expand the global view of culture and the contributions of Oceanic peoples to World Heritage, and underscore that for so many indigenous peoples, nature and culture are one."

Papahānaumokuākea is already the country's largest conservation area. Thick clouds of seabirds, abundant corals, vibrant reef fish, apex predators (e.g. sharks), and endangered seals and turtles accompany treasured, but long abandoned, Polynesian ruins on these remote islands

http://papahanaumokuakea.gov

Monitoring Schedule

October
Rain forest Plant Communities Monitoring at HAVO
Pilot test the Established Invasive Plant Species Monitoring Protocol at HAVO
Vegetation mapping field data collection at HAVO and KALA
Vegetation mapping field data collection on Ta'u and Ofu Islands at NPSA
Vegetation mapping accuracy assessment field data collection at WAPA
Water Quality Monitoring at AMME and HALE
Marine Fish Monitoring at KAHO
Benthic Marine Monitoring at KAHO

November
Vegetation mapping field data collection at HAVO and KALA
Vegetation mapping field data collection on Tutuila Island at NPSA
Water Quality Monitoring at PUHO, KAHO, ALKA, PUHE, KALA, WAPA, and AMME
Groundwater Monitoring at KAHO and AMME

December
Vegetation mapping field data collection at HAVO and KALA
Water Quality Monitoring at NPSA
Anchialine Pool Monitoring at PUHO and KAHO

The Easiest Way to Research National Parks

Simply type nrinfo directly into your web browser in Internet Explorer™ from any NPS computer, and the world of national park science, literature, data, species lists, and much more is at your fingertips.

If you are sitting at a National Park Service computer... Drop what you are doing and try this now !
General public access will be available soon

Kids, Corals, and Climate Change

The PACN Inventory & Monitoring Program has teamed up with network parks, the University of Maryland Center for Environmental Science (UMCES), and Centers for Ocean Sciences Education Excellence (COSEE) to create an interactive, classroom and web-based, education module which highlights coral reefs and issues such as climate change in four national parks.

This summer a multidisciplinary team comprised of a science communicator, an O'ahu science teacher, a marine sciences graduate student and two undergraduate students from the University of Hawaii at Hilo worked very closely for two months with the sole goal of creating the groundwork for a coral reef education program. The group consulted many park interpreters and scientists as well as a variety of educators about the content and approaches that should be included in an effective educational project.

The four highlighted PACN parks are WAPA, KAHO, NPSA, and KALA. Each of these parks has unique marine resources and faces unique threats. Content for the module has partially focused on the relationships that the various island peoples, from and around these parks, have with the reefs.

Currently, science communicators and a web designer are refining the content and activities, enhancing graphical design, and laying the foundation for integrating the material onto the web, into classrooms, and out in the field. Mock-ups are being converted into interactive web pages that will be hosted on the COSEE Coastal Trends website, which will ensure broad dissemination of the materials.

The classroom based practical activities and learning materials will be teacher tested and evaluated before public release. A focus of the effort will be in "teaching the teachers" outreach workshops planned for PACN islands. Middle school teachers will be given a packet of learning materials and taught how to bring the *coral reefs in a changing climate* message into classrooms.

The PACN is one of only two networks monitoring tropical coral reefs. This position supports the need to discuss reef composition, food webs, climate change, fishing pressure, and many other issues while focusing on Pacific island national parks. These parks contain significant and beautiful reef ecosystems and extending a sense of ownership, knowledge, and stewardship to the youth of the Pacific islands (and beyond) is vital to the longevity and stainability of the reefs. Check back for updates and more details on this project in future newsletters.

— C. Nash & G. Kudray

UMCES Integration & Application Network: http://ian.umces.edu/
COSEE Coastal Trends: http://www1.coseecoastaltrends.net/modules/

This is a prototype homepage for the coral reef education module. When the user clicks on an icon she is transported to a corresponding lesson. For example, when the user clicks on the shark she will go to an activity page about coral reef predators.

The Enigma of Ofu Lagoon, American Samoa

How Oceans Change Yet Some Things Stay the Same

Ofu Lagoon lies along the southern shore of Ofu Island in the National Park of American Samoa. The lagoon is separated from the ocean during low tide and is subject to large temperature fluctuations coupled with significant pH (acid level) and dissolved oxygen (DO) changes. Average daily temperatures, pH, and DO measurements are comparable to other coral reefs; however, substantial variations during the course of the day closely correspond with the tides (like a puddle heating up in the sun at low tide). The I&M Program established a series of monitoring stations in 2009 to develop a deeper understanding of environmental changes within the lagoon. Water quality measurements from these stations captured daily temperatures that regularly exceed 86°F, with variations greater than 8°F, pH changes exceeding 0.5pH units, and DO fluctuations of 50% - 200%. What this 'boils' down to is this lagoon, and the corals within it, experience extreme changes on a daily basis.

Despite fluctuations which have occurred for years, Ofu Lagoon appears somewhat healthy relative to other coral reefs, indicating that fairly healthy coral systems can persist even with significant environmental stressors. With global climate change expected to increase sea surface temperatures and decrease pH (oceans become more acidic), understanding why this particular coral reef system remains healthy is quite possibly a crucial piece of the global coral health puzzle.

Of major importance is the difference in pH levels between two study periods (data from 2009-2010 were compared with data from 2000-2001). While the lagoon is flushed daily by oceanic water it becomes more acidic, but the average change between these two study periods indicates that the water is even more acidic than before. Increasingly acidic water caused by increased atmospheric CO_2 (a greenhouse gas) is a concern for long-term coral health.

Despite experiencing environmental conditions that are known to stress corals, corals within this lagoon appear to be healthy. Continued research investigating Ofu Lagoon's coral reefs within the framework of global climate change may yield significant clues about world-wide coral vulnerability.

— T. Jones & K. Kageyama

This water quality measurement device records temperature, pH, dissolved oxygen, conductivity, chlorophyll, and more.

Scientists take water quality measurements on the shallow reef.

These colorful seascapes are typical of Ofu Lagoon.

Background: Ofu Lagoon

Thirty Days and 9,845 Birds Later

Quick Notes on 2010 HAVO Bird Survey:

29 total species recorded
10 native species
5 native endangered species
- Nēnē
- 'Io
- 'Akiapōlā'au
- Hawai'i Creeper
- Hawai'i 'Ākepa

☹ Generally, most birds have increased except a decline in 'I'iwi in a Kahuku tract and 'Ōma'o in the 'Ōla'a tract.

☺ 'Ōma'o, absent from the S.W. flank of Mauna Loa since the 1970s, was detected in the high elevation tracts of that region

The landbirds of the Hawaiian Islands are among the most beautiful and unique birds in the world. The islands have among the highest percentage of endemic species found anywhere, primarily because of the their isolation and variety of habitats. Tragically, Hawaiian birds have experienced a litany of pressures resulting from introduced species, diseases, and the effect of man's manipulation of critical bird habitat.

Only 42 of the once 113 species of native landbirds persist in the islands. Thirty of the remaining species are considered threatened or endangered and 10 of them have not been seen in the last 40 years. The success of Hawaii's remaining species relies on the health of native forests, conservation actions, and the ability of species to adapt to pressures in the environment.

One of the biggest pressures is avian malaria which has devastated whole populations of honeycreepers. The disease is passed through the bite of a mosquito and many native birds succumb within weeks of exposure. Fortunately, some populations of Hawaii ʻAmakihi and ʻApapane have demonstrated a resistance to avian malaria after 180 years of intense exposure. These birds can even be found in high densities in warmer, lower elevations where mosquitoes are present. However, honeycreepers such as the endangered Hawaiʻi Creeper, ʻAkiapōlāʻau, and ʻĀkepa are still quite susceptible to the disease. These birds are only found in small numbers in mature native forests above the range of mosquitoes.

An 'Io, Hawaiian Hawk, eyes potential prey on the facing page. Only found on Hawai'i Island, this species is occasionally seen in Hawai'i Volcanoes National Park.

'Apapane are one of the few commonly seen native honeycreepers still found in Hawai'i Volcanoes and Haleakalā National Parks. This one is feeding hungry chicks.

Monitoring of bird populations allows resource managers to identify habitat critical for species survival. The NPS Inventory and Monitoring Program has begun a Landbirds Monitoring Protocol designed to collect data to determine species-specific estimates of numbers, densities, and trends of native and non-native landbird populations. Surveys are being conducted in Hawaiʻi Volcanoes National Park (HAVO), Haleakalā National Park (HALE), and the National Park of America Samoa (NPSA) every few years to determine meaningful changes in bird populations over time.

Hawai'i Volcanoes National Park is the largest park in the Pacific Island Network and the first park surveyed with this protocol. HAVO contains huge tracts of native forest with one of the largest populations of native landbirds in the Hawaiian Islands. Eight tracts totaling 23,364 hectares have been identified for surveying within the park.

The monitoring team uses the point-transect method to record birds. Long (up to several miles) transects (straight lines) are established in each tract by aid of GPS, GIS, and compass navigation. Stations are marked 200m apart on each transect. Observers, or primary point counters, identify and record each bird heard or seen during an 8-minute period at each station. Distance from bird to observer is also recorded. Then analysts use that data to estimate the density and abundance of each species. In March 2010, I led a team of six field technicians who were granted the responsibility of surveying HAVO for landbirds. This was a dream job for all of us because we would spend the majority of our time in beautiful native forests documenting Hawaii's most charismatic terrestrial wildlife.

Each of us had spent years in the field learning every sound Hawaii birds make, allowing us to "catch" them in our data books. We armed ourselves with binoculars and raingear and took to the forest to document the seldom seen honeycreepers of HAVO.

The crew woke up dark and early each morning to meet the birds in some of the most dense and isolated forests of Hawai'i Island. Our senses were in tune as we concentrated on every move and sound of the forest.

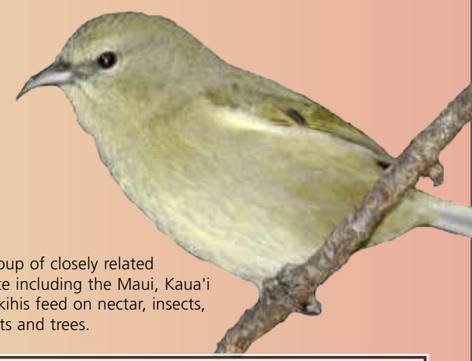
Thirty days and 9,845 birds later we concluded our survey effort. Results were positive for most native species. ʻApapane and Hawaiʻi ʻAmakihi were by far the most abundant native species. ʻApapane occurred in densities far above all other species in every tract with the exception of the prolific non-native Japanese White-eye, which unlike ʻApapane, occur in almost every forested habitat on Hawaiʻi Island. The ʻIʻiwi, perhaps Hawaii's most recognizable and iconic species, was detected in modest numbers in most tracts above 5,500 feet in elevation. The ʻIʻiwi is very susceptible to avian malaria, so the species is virtually non-existent in forests where mosquitoes are present. HAVO's endangered forest birds were detected in the mature ʻōhiʻa dominated forests of the southeast slopes of Mauna Loa. Only four ʻAkiapōlāʻau were detected. Whereas 17 ʻĀkepa and 22 Hawaiʻi Creepers were documented during the surveys, along with more abundant and non-native species. Every endangered species occurred in numbers far too low to estimate abundance or a change in density. Unfortunately, it seems that even under federal protection from development and logging, these birds tenuously hang by a thin thread.

HAVO's high and cool volcanic slopes are a vital refuge for birds as a warming climate may push disease carrying mosquitoes higher into the remaining native landbirds' range. Long-term monitoring is a crucial tool the parks can use to ensure that they are doing everything they can to protect these unique birds.

— S. Judge

Crew leader Seth Judge smiles for a self portrait as he prepares to load a helicoptor. Some of the most remote landbirds monitoring areas require that the team fly their gear to the worksite.

See the landbirds monitoring team in action ! (12Mb .mov file). http://science.nature.nps.gov/im/units/pacn/videos/MP4_Videos/landbirds.mov



The Hawai'i 'Amakihi is one of a group of closely related honeycreepers found across the state including the Maui, Kaua'i and O'ahu 'Amakihi varieties. 'Amakihis feed on nectar, insects, juices, fruit pulp, and sap from plants and trees.

Next on the schedule is HALE in 2011 and NPSA in 2012; two of the Pacific West Region's most spectacular national parks and home to treasures such as the Kiwikiu, the 'Ākohekohe, the White-collared Kingfisher, and the Cardinal Honeyeater.

Species on the loose!
The parks need your help!

Coqui Frogs Invade National Parks

Found across East Hawai'i Island and in pockets across the rest of the state, coqui frogs have become a ubiquitous part of life for many people. Children and newcomers to Hawaii may not remember a time when only the crickets sang at night. That time was only about 22 years ago. For many people, plants, and other animals, evening time has been forever altered by the loud calls and big appetites of coqui frogs. As populations of this invasive amphibian reach astounding densities in the lowlands, they are venturing out into less than ideal habitats. Many of these habitats are in dryer and cooler regions than what the frogs usually prefer. These same regions contain many of Hawaii's national parks. Resource managers from all of Hawaii's national parks are aware of the encroaching pest and fear the negative impacts they will have on the ecosystems and visitor experiences in the parks. Vigilant removal projects are active in many areas statewide. Removing the frogs from an area usually involves hand capturing or spraying the foliage with a citric acid solution. For more information on coqui frogs and to listen to a sample of their calls, visit the Hawaii Invasive Species Council website: http://www.hawaiiinvasivespecies.org/pests/coqui.html

Known National Park Hideouts

Hawai'i Volcanoes National Park (about 190 reported and 170 removed in 2009-2010; hundreds more frogs live in subdivisions near the park boundary)

Haleakalā National Park (none reported in the park, but the frogs pose a strong potential threat due to established populations elsewhere on Maui)

Kalaupapa NHP (none reported)

Pu'uhonua o Hōnaunau NHP (2 frogs reported and removed since 2007)

Pu'ukoholā NHS (none reported)

Kaloko-Honokōhau NHP (1 frog reported and removed; small populations near the park boundary)

The smaller and lighter colored male coqui frogs call loudly and frequently on warm nights.

HAWAII NATIONAL PARKS'

LEAST WANTED

Coqui frog
(female)

a.k.a.
Eleutherodactylus coqui

Crime: Disturbing the peace

In Hawaii, these Caribbean frogs have no natural predators or competitors which creates conditions for populations to reach up to several thousand per acre. Collectively, they eat huge amounts of insects which is known to disturb the balance of native ecosystems. Moreover, the males emit a loud, high-pitched, two-note "co-kee" noise from dusk until dawn.

How to identify coqui frogs

Easily identified, this small frog is brown to grey-brown in color with a thin tan stripe down the middle of its back. It thrives in moist and thickly vegetated areas up to 3,900 feet in elevation.

Be a crime fighter

- √ Volunteer with a community association to control coqui frogs.
- √ It is illegal to keep them as pets.
- √ Alert a ranger if you see or hear a coqui frog in a national park.
- √ Don't harbor a fugitive! If you have been in an area with coqui frogs, check under your car and remove any frogs before visiting another area.

— C. Nash